

PATENT ABSTRACTS OF JAPAN

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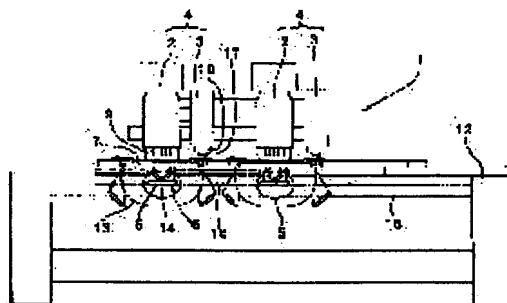
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(54) EMBROIDERY SEWING MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an embroidery sewing machine capable of carrying out embroidery processing and pinting processing in a wide range without excessively restricting the movable range of an embroidery frame and a processing cloth by the interference of a cylindrical bed when a cylindrical process cloth is subjected to embroidery processing and pinting processing.

SOLUTION: An embroidery sewing machine 1 comprises embroidery heads 2 which are laid at the upper part of a frame 12 and vertically drives needles 9 into which needle threads are introduced, printing heads 3 which are installed at the sides of the embroidery heads 2 and stick a coloring material to processing clothes 13, cylindrical beds 5 which are positioned below the embroidery heads 2 during embroidery processing and supply bobbin threads to the needles 9 and bed driving mechanisms 6 for moving the cylindrical beds 5 so as to position the cylindrical beds below the printing beds 3 when printing processing.



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CLAIMS

[Claim(s)]

[Claim 1] The embroidery sewing machine contain the embroidery head which carries out the vertical actuation of the needle with which it was prepared in the upper part of a machine frame, and it let the needle thread pass, the print head which it is prepared [print head] in the side of this embroidery head, and make the charge of a coloring matter adhere to a processing cloth, the cartridge bed which are located under said embroidery head at the time of embroidery processing, and supply a bobbin thread to said needle, and the cartridge bed drive which make move this cartridge bed at the time of print processing so that it may be located under said print head.

[Claim 2] The embroidery head which carries out vertical actuation of the needle with which it was prepared in the upper part of a machine frame, and let the needle thread pass, The print head which it is prepared [print head] in the side of this embroidery head, and makes the charge of a coloring matter adhere to a processing cloth, So that an embroidery head may be located above this cartridge bed at the cartridge bed which supplies a bobbin thread to said needle at the time of embroidery processing, and the time of embroidery processing and a print head may be located above this cartridge bed at the time of print processing The embroidery sewing machine containing the head drive to which an embroidery head and a print head are moved.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the embroidery sewing machine for performing not only embroidery processing but print processing to the processing cloth of cartridges, such as a T-shirt and a sweater, by which sewing was carried out.

[0002]

[Description of the Prior Art] Conventionally, there are some which were indicated by JP,5-272086,A as an embroidery sewing machine which performs embroidery processing and print processing of ink to a processing cloth. By this embroidery sewing machine 80, as shown in drawing 12 and drawing 13, a frame 82 is horizontally formed above a table 81, three embroidery heads 83 are arranged in the front face of this frame 82, and the ink head 84 is arranged in the location which corresponds to the rear face of this frame 82 respectively with each embroidery head 83. Moreover, the bed 86 with which the top face became flat-tapped with a table 81 is built into a table 81, and the embroidery frame 85 with which one processing cloth 87 of an object was spread is formed in right above [of this table 81 and a bed 86]. And at the time of embroidery processing, based on shank data, an embroidery frame 85 drives in the lower part of the embroidery head 83, and embroidery processing is performed by the embroidery head 83. Moreover, at the time of print processing, based on shank data, an embroidery frame 85 drives in the lower part of the ink head 84, and print processing is performed by the ink head 84.

[0003]

[Problem(s) to be Solved by the Invention] However, the technique which can perform embroidery processing and print processing to the processing cloth of cartridges, such as a T-shirt and a sweater, with which the superficial processing cloth of an one-sheet object was targetted for sewing of the above-mentioned embroidery sewing machine 80 was not indicated.

[0004] Since it is necessary to spread the processing section of this processing cloth to an embroidery frame, and to hang down and lower the remainder in order to carry out embroidery processing to the processing cloth of a cartridge now, while cutting and lacking said table, said bed is made into a cartridge and it must enable it to enter the interior of a processing cloth. For this reason, the movable range of an embroidery frame and a processing cloth is restricted to the range in which the processing cloth of a cartridge and the bed of the cartridge which entered into this do not interfere. Therefore, like the above-mentioned embroidery sewing machine 80, when an ink head was prepared behind an embroidery head, the cartridge bed needed to be prepared even in the lower part of an ink head for a long time from the lower part of an embroidery head, and implementation was difficult. Moreover, even if it approached the side of an embroidery head as much as possible and prepared the ink head in it, with the cartridge bed with which an embroidery head remains caudad, a motion of the longitudinal direction of the embroidery frame to which it was made to move under the print head, and a processing cloth will be restricted greatly, and was not able to perform print processing broadly.

[0005] Also when the object of this invention solves the above-mentioned technical problem and embroidery processing is performed to the processing cloth of a cartridge, and also when performing

print processing, it is for providing about the embroidery sewing machine which the movable range of an embroidery frame and a processing cloth is not restricted too much by interference of a cartridge bed, and can perform embroidery processing and print processing broadly.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned object, the embroidery sewing machine of this invention The embroidery head which carries out vertical actuation of the needle with which it was prepared in the upper part of a machine frame, and let the needle thread pass, The print head which it is prepared [print head] in the side of this embroidery head, and makes the charge of a coloring matter adhere to a processing cloth, It constituted so that the cartridge bed which is located under said embroidery head at the time of embroidery processing, and supplies a bobbin thread to said needle, and the cartridge bed drive made to move this cartridge bed at the time of print processing so that it may be located under said print head might be included.

[0007] Moreover, the embroidery head which carries out vertical actuation of the needle with which the embroidery sewing machine of this invention was formed in the upper part of a machine frame, and it let the needle thread pass, The print head which it is prepared [print head] in the side of this embroidery head, and makes the charge of a coloring matter adhere to a processing cloth, So that an embroidery head may be located above this cartridge bed at the cartridge bed which supplies a bobbin thread to said needle at the time of embroidery processing, and the time of embroidery processing and a print head may be located above this cartridge bed at the time of print processing It can also constitute so that the head drive to which an embroidery head and a print head are moved may be included.

[0008] The following modes can be illustrated as the above-mentioned head drive.

(1) The mode which makes a longitudinal direction carry out both-way straight-line migration of the head pair which consists of an embroidery head and a print head.

(2) The mode which carries out both-way migration of the head pair which consists of an embroidery head and a print head around vertical axes.

[0009] Especially the class of print head is not limited but can illustrate an ink jet method (what injects ink, hits against a processing cloth and draws an alphabetic character, a graphic form, a notation, etc. as a meeting of a dot according to the deformation force of a piezoelectric device, or the blowing pressure force of the heated ink), and a hot printing method. Although the class of charge of a coloring matter changes with classes of print head and it is not limited especially, in the case of an ink jet method, color ink, pigment ink, etc. can be illustrated, and, in the case of a hot printing method, the melting imprint sheet which comes to apply the color ink containing binding material, such as a wax, pigment ink, etc. to a film etc. can be illustrated.

[0010] The approach to which only the charge of a coloring matter of the color made into the object is made to adhere as the coloring approach of the processing cloth by the charge of a coloring matter, cyanogen and a Magenta, and the subtractive-color-mixture method for expressing colors various by making it adhere combining three colors of yellow can be illustrated. In the case of the latter, it is desirable by adding black to said three colors and using this black about a black part to make it vividness come out more.

[0011] A cartridge bed drive and a head drive are not limited to specific structure, but can illustrate the following device.

(1) The device equipped with a male screw shaft, the motor made to rotate this male screw shaft possible [a direction change], the female screw member which is screwed in said male screw shaft and carries out straight-line round trip migration with said revolution, and the bond part material which combines this female screw member with a cartridge bed.

(2) The device equipped with the spiral grooved cam prepared in the periphery of a shaft, the motor rotated possible [a direction change of this shaft], the cam follower which inserts into this grooved cam and carries out straight-line round trip migration with said revolution, and the bond part material which combines this cam follower with a cartridge bed.

[0012] (3) The device equipped with the bond part material which combines a cartridge bed with some of a wheel, motors rotated possible [a direction change of this wheel], the belt or chain which is almost

wound around this wheel and carries out both-way migration with said revolution, and these belts or chains.

(4) The device equipped with rack - and - pinion gear device, the motor rotated possible [a direction change of this pinion], and the bond part material which combines a cartridge bed with these some racks.

[0013] In addition, in this invention, a "processing cloth" is a large concept which is not limited to the cloth made from fiber and also contains nature, synthetic leather, and a resin sheet.

[0014]

[Embodiment of the Invention]

<< -- first operation gestalt>> -- 2 sets of head pairs which made the lot the embroidery head 2 of a multi-needle type, and the print head 3 of the ink jet method which injects color ink on a processing cloth in the upper part of a machine frame 12 as drawing 1 - drawing 10 showed the embroidery sewing machine 1 of the first operation gestalt which materialized this invention and showed it to drawing 1 and drawing 2 in this embroidery sewing machine 1 -- 4 is installed successively. Under each embroidery head 2, the cartridge bed 5 protrudes ahead, and the cartridge bed drive 6 is combined with this cartridge bed 5. the cartridge bed 5 -- up an embroidery frame 7 is arranged immediately and the frame drive 8 is combined with this embroidery frame 7. The processing section 25 of the processing cloth 13 of a cartridge was spread by the embroidery frame 7, and the remainder 26 of this processing cloth 13 droops to the cartridge.

[0015] As shown in drawing 3 , said embroidery head 2 is equipped with two or more needles 9 with which it let the needle thread pass, and it is constituted so that it may choose alternatively [one] of them and vertical actuation may be carried out. A blind stitch is formed in the processing section 25 of the processing cloth 13 spread by the embroidery frame 7 by this needle 9 and the iron pot 14 which was built in the cartridge bed 5 and which is mentioned later.

[0016] As shown in drawing 1 and drawing 4 , said print head 3 equips the soffit section with a movable head 10, it goes up and evacuates this movable head 10 with a vertical drive (graphic display abbreviation) at the time of embroidery processing, at the time of print processing, as a two-dot chain line shows to drawing 4 , descends, and approaches the processing cloth 13. The movable head 10 is equipped with three ink injection devices 17C, 17M, and 17Y which inject the ink supplied from each cartridge in the shape of a dot matrix to the processing cloth 13 as the ink (color ink or pigment ink) of three colors of cyanogen, a Magenta, and yellow is indicated to be three cartridges (graphic display abbreviation) with which it was filled up, respectively to drawing 6 .

[0017] As each ink injection devices 17C, 17M, and 17Y are shown in drawing 6 , each nozzles 18C, 18M, and 18Y of the predetermined number (in this drawing, it expresses with four near a minimum for graphic display simplification) chosen from 2-1024 pieces (it is instantiation and not limited to this) are allotted to the parallel triplex row. Each nozzles 18C, 18M, and 18Y inject the ink of cyanogen, a Magenta, and yellow, respectively, and carry out print processing by various colors by the subtractive-color-mixture method by these 3 color at the processing cloth 13.

[0018] Said cartridge bed 5 is carrying out the cartridge so that it can enter inside the processing cloth 13 of the cartridge set to the embroidery frame 7, and it is supported movable along with the guide rail 16 with which the base was established in the top face of the bed frame 15. And at the time of embroidery processing, it is moved by the cartridge bed drive 6 so that it may be located under the embroidery head 2 (drawing 3), and at the time of print processing, the cartridge bed 5 is moved so that it may be located under the print head 3 (drawing 4).

[0019] If the configuration of the cartridge bed 5 is explained, as shown in drawing 5 (a), an iron pot 14 will be built in the point, and this iron pot 14 will rotate with the shaft 33 currently supported free [a revolution] to the wall of the cartridge bed 5. a shaft 33 -- the iron pot driving shaft 34 -- a bevel gear pair -- revolution actuation is carried out through 35, this iron pot driving shaft 34 is inserted in a shaft 33 and in the shape of a rectangular cross over each cartridge bed 5, and is supported free [a revolution], and revolution actuation is carried out by the motor (graphic display abbreviation) through the transfer member 36 and a clutch 37. Moreover, to the iron pot driving shaft 34, the colors 38 and 38

of the couple which pinches the insertion section of the end face section left-hand side wall of each cartridge bed 5 have fixed.

[0020] As the cartridge bed drive 6 is shown in drawing 5 (a), it has the male screw shaft 30, the motor 31 made to rotate the male screw shaft 30 possible [a direction change], and the female screw member 32 which is screwed in the male screw shaft 30 and carries out straight-line round trip migration with said revolution, and this female screw member 32 is combined with the cartridge bed 5. And if a motor 31 is rotated, according to the hand of cut, the cartridge bed 5 will move to the right or a left. At this time, the iron pot driving shaft 34 also moves with the cartridge bed 5 with the colors 38 and 38 of said couple. When the cartridge bed 5 is located under the left end 2 of a guide rail 16, i.e., the embroidery head A clutch 37 will be cut, if a clutch 37 is combined, revolution actuation of the iron pot driving shaft 34 is carried out (drawing 5 (a)) and the cartridge bed 5 moves to the method of the right, i.e., the print head 3 side, (drawing 5 (b)).

[0021] Said frame drive 8 is a well-known device, and it is constituted so that an embroidery frame 7 may be driven based on data in the direction of front and rear, right and left (the direction of X-Y). And while driving an embroidery frame 7 in the direction of front and rear, right and left based on the embroidery data which the frame drive 8 mentions later at the time of embroidery processing, when the embroidery head 2 carries out vertical actuation of the needle 9, embroidery processing of a predetermined design is performed to the processing section 25 of the processing cloth 13 spread by the embroidery frame 7 (drawing 3). Moreover, while driving an embroidery frame 7 in the direction of front and rear, right and left based on the print data which the frame drive 8 mentions later at the time of print processing, when a print head 3 injects ink, print processing of a predetermined design is performed to the processing section 25 of this processing cloth 13 (drawing 4).

[0022] The creation approach of the embroidery data in this operation gestalt and print data advances in a procedure as shown in drawing 7 . As data origination equipment used for this data origination approach, it has a floppy disk drive and the microcomputer (graphic display abbreviation) to which the display, the keyboard, the digitizer, the mouse, etc. were connected is used.

[0023] (1) The input of graphic data (step S40)

The profile data of the graphic form which processes [embroidery-] or processes [print-] it are inputted into data origination equipment with a digitizer, a mouse, an image scanner, etc.

[0024] (2) The attribute data input to each graphic data (step S41)

Assignment of a needle and a stitch is inputted as the attribute data to each graphic form which carries out embroidery processing. Moreover, to each graphic form which carries out print processing, as the attribute data, assignment of a color and a pattern is inputted and it inputs further whether it is a substrate pattern.

[0025] (3) Creation of embroidery data and print data (step S42)

Data origination equipment creates one-stitch data from the profile data and stitch by the well-known approach to the graphic form with which assignment of embroidery processing was carried out.

Moreover, to the graphic form with which assignment of print processing was carried out, it changes into the bit map format expressed by the meeting of the dot doubled with the print resolution of the ink injection device 17 from the profile data, a color, and a pattern. And the print data for every horizontal migration of an embroidery frame are created by dividing the data of this bit map format into the band-like data which have the dot width of face for several nozzle minutes in the direction of Y.

[0026] Based on the embroidery data and print data which were created in this way, substrate print processing is carried out first, and the embroidery sewing machine 1 continues, it carries out embroidery processing and performs the remaining print processing at the last.

[0027] Next, when the details of actuation of the ink injection device 17 in the case of carrying out print processing explain to a processing cloth 13, the case where print processing is carried out [yellow / cyanogen, a Magenta, and] in Isshiki which mixed at the fixed rate in the abbreviation rectangle range 27 which shows signs that the ink injection device 17 injects ink, serially to the processing cloth 13 spread on the embroidery frame moved rightward at ** - **, and is shown with a two-dot chain line in ** is shown in drawing 8 .

[0028] First, as shown in **, an embroidery frame 7 is moved so that left-hand side ink injection device 17C may serve as a location at the right end of the abbreviation rectangle range 27. And if cyanogen ink is injected by left-hand side ink injection device 17C in this location, print processing of the cyanogen ink will be carried out at the shape of a straight line (the lower left is hatching of **).

[0029] Next, as an embroidery frame is moved rightward, it goes, injecting ink by left-hand side ink injection device 17C and it is shown in **. If ink injection device 17M of a center become a location at the right end of the abbreviation rectangle range 27 Magenta ink is injected by ink injection device 17M of a center, and it puts on the cyanogen ink in which print processing was carried out by left-hand side ink injection device 17C, and it is mixed, or it distributes and print processing of the Magenta ink is carried out (the lower right is hatching of **).

[0030] As Yellow ink is injected by right-hand side ink injection device 17Y (level hatching) and it is shown in ** like the above, the ink of three colors piles up, is mixed or distributed, and print processing of the desired color is carried out.

[0031] If an embroidery frame is furthermore moved rightward and left-hand side ink injection device 17C arrives at the left end of the abbreviation rectangle range 27, injection of the cyanogen ink by left-hand side ink injection device 17C will be stopped. And as shown in **, injection of ink is stopped similarly and a series of print processing actuation completes other ink injection devices 17M and 17Y. In addition, an embroidery frame can be moved leftward, print processing can also be carried out, and this omits explanation in order to make bilateral symmetry the case where it is made to move rightward [above-mentioned].

[0032] Thus, whenever it makes the horizontal migration of the embroidery frame carry out in the direction of X, band-like print processing which has the dot width of face for several nozzle minutes in the direction of Y can be carried out according to the ink injection device 17. Therefore, shifting an embroidery frame for this every dot width of face in the direction of Y, this horizontal migration is repeated and print processing of the desired graphic form is carried out at the processing cloth 13. For example, in carrying out print processing of the smeared-away circle, the ink injection device 17 draws the locus shown in drawing 9 on the processing cloth 13.

[0033] Next, the embroidery sewing machine 1 of this operation gestalt explains taking the case of the case where the shank which shows a series of actuation in the case of embroidery-processing and print processing it actually to the processing cloth 13 at drawing 10 is given. The shank of drawing 10 consists of a star's embroidery shanks 21 and 22 prepared in a part of substrate print shank 20 of an abbreviation square, and this substrate print shank 20, and the circular print shank 24 is established in the center of the embroidery shank 21. Moreover, the cartridge bed 5 and embroidery frame 7 of the embroidery sewing machine 1 shall be located under the embroidery head 2 in an initial state.

[0034] First, although it is print processing of the substrate print shank 20, as shown in drawing 4, the embroidery frame 7 and the cartridge bed 5 with which the processing cloth 13 of a cartridge was spread are moved under the print head 3, the movable head 10 of a print head 3 descends, and the ink injection device 17 is located on the processing cloth 13. And based on print data, an embroidery frame 7 drives in the direction of X-Y, and when ink is injected by the ink injection device 17 synchronizing with it, print processing of the substrate print shank 20 is carried out. Termination of print processing raises a movable head 10 to the original location.

[0035] Next, although it is embroidery processing of the embroidery shanks 21 and 22, as shown in drawing 3, an embroidery frame 7 and the cartridge bed 5 are moved under the embroidery head 2. And the needle specified by embroidery data is chosen, an embroidery frame 7 drives in the direction of X-Y based on the embroidery data of the embroidery shanks 21 and 22, and when vertical actuation of the needle 9 is carried out by the embroidery head 2 synchronizing with it, sequential processing of the embroidery shanks 21 and 22 is carried out.

[0036] By carrying out print processing to the embroidery thread of the embroidery shank 21, the print shank 24 given in the center of the embroidery shank 21 stains embroidery thread, and performs it like print processing of the above-mentioned substrate print shank 20.

[0037] In addition, a series of actuation of embroidery processing shown above and print processing is

instantiation, and is not limited to this. Therefore, embroidery processing and print processing are freely combinable.

[0038] Thus, in order that the cartridge bed 5 may move under the print head with an embroidery frame 7 at the time of print processing, even when performing embroidery processing and print processing of a shank which spread in the whole table hemihedry of the cylinder part of the processing cloth 13 of a cartridge according to the embroidery sewing machine 1 of this constituted operation gestalt, the movable range of an embroidery frame 7 is not restricted by the cartridge bed.

[0039] Moreover, since each ink injection device 17 of this embroidery sewing machine 1 is equipped with two or more nozzles 18 and print processing of the dot width of face for several nozzle minutes can be performed at once, there is little migration of an embroidery frame 7 and print processing can be performed at a high speed.

[0040] Furthermore, since this embroidery sewing machine 1 has a print processing function, it can be performed without re-covering of embroidery processing and print processing of the processing cloth 13. Therefore, the shank which combined the embroidery shank and the print shank can be created at accuracy as shank data, without a shank location mutual [these] being out of order. And since an embroidery shank can also be stained by print processing, the embroidery of the pattern which used the multiple color more than the number of stitch with which an embroidery sewing machine is equipped is easily realizable. Therefore, even if an embroidery head is a single needle type, the multicolor embroidery same in false as the embroidery sewing machine of a multi-needle type can be performed by embroidering with white yarn and performing print processing from on this embroidery.

[0041] << -- second operation gestalt>> -- the head pair which consists of an embroidery head 47 and a print head 3 while drawing 11 and drawing 12 show the embroidery sewing machine 44 of the second operation gestalt which materialized this invention and the cartridge bed 45 is fixed to the bed frame 46 in this embroidery sewing machine 44 -- 48 is supported movable along with the guide rail 50 with which the base was established in the top face of the table frame 49. and a head pair -- at the time of embroidery processing, the embroidery head 47 is located above the cartridge bed 45, and at the time of print processing, 48 is moved by the head drive 51 so that a print head 3 may be located above the cartridge bed 45. Since the embroidery sewing machine 44 in this operation gestalt is different from the first operation gestalt only in this point, about the same part as the first operation gestalt, it gives the same sign to drawing and avoids duplication explanation.

[0042] If the configuration of the embroidery head 47 is explained, as shown in drawing 12, the point will be equipped with the needle drive 52, and this needle drive 52 will rotate with the shaft 53 currently supported free [a revolution] to the wall of the embroidery head 47. a shaft 53 -- the embroidery head driving shaft 54 -- a bevel gear pair -- revolution actuation is carried out through 55, this embroidery head driving shaft 54 is inserted in a shaft 53 and in the shape of a rectangular cross over each embroidery head 47, and is supported free [a revolution], and revolution actuation is carried out by the motor (graphic display abbreviation) through the transfer member 56 and a clutch 57. moreover -- the embroidery head driving shaft 54 -- each -- the colors 58 and 58 of the couple which pinches the insertion section of the end face section left-hand side wall of head pair 48 have fixed.

[0043] the motor 61 made to rotate the male screw shaft 60 and this male screw shaft 60 possible [a direction change] as the head drive 51 is shown in drawing 12, and the female screw member 62 which is screwed in the male screw shaft 60 and carries out straight-line round trip migration with said revolution -- having -- this female screw member 62 -- a head pair -- it is combined with 48. and -- if a motor 61 is rotated -- the hand of cut -- responding -- the right or a left -- a head pair -- 48 moves. this time -- the colors 58 and 58 of said couple -- the embroidery head driving shaft 54 -- a head pair -- 48 -- moving -- coming -- **** -- a head pair -- when located above the cartridge bed 45 by 48, the left end 47, i.e., the embroidery head, of a guide rail 50, a clutch 57 is combined and the embroidery head driving shaft 54 carries out revolution actuation -- having -- a head pair -- a clutch 57 will be cut if 48 moves to the method of the right.

[0044] Also according to this operation gestalt, the same effectiveness as the first operation gestalt can be acquired.

[0045] In addition, in the range which is not limited to the configuration of said operation gestalt, for example, does not deviate from the meaning of invention as follows, this invention can be changed suitably and can also be materialized.

(1) Let me fluctuate the number of nozzles 18.

(2) Arrange each ink injection device 17 in the shape of a straight line to the soffit of a movable head 65 to be shown in drawing 13 .

[0046] (3) To be shown in drawing 14 (a), approach and arrange three nozzles 18 in the soffit of a movable head 66, and use each nozzle 18 for cyanogen, a Magenta, and the ink of yellow, and ink should inject towards one point from each nozzle 18 so that a broken line shows to drawing 14 (b). If it carries out like this, since processing for 1 dot of print data can carry out simultaneously, migration of an embroidery frame can be lessened as compared with the case where the location of the ink injection place from each nozzle 18 is made separate.

[0047] Furthermore, since one print processing is made at a time, using the one-stitch data for embroidery processing, an embroidery frame is driven and print processing can also be carried out. Since an embroidery frame is moved so that direct drawing ***** may be traced (for example, if it is a curve curve) especially when carrying out print processing of drawing ***** , as compared with the case where it moves so that all lines may be traced in order using the print data created by the paragraph [0023], there is little migration of an embroidery frame and it can carry out print processing to a high speed.

[0048] (4) Consider as the ink injection device which arranged the nozzle in the direction of X in the shape of a straight line, and inject ink from a nozzle, moving an embroidery frame in the direction of Y.

(5) Make a nozzle pivotable a core [the shaft of the processing surface of cloth and a perpendicular direction], rotate the include angle of a nozzle so that migration of an embroidery frame may become the smallest according to the configuration of a shank, and drive an embroidery frame. For example, in carrying out print processing of the straight line which was rotated 45 degrees and drawn, a nozzle is rotated 45 degrees and it carries out by driving an embroidery frame in a direction 45 degrees.

[0049]

[Effect of the Invention] Since the embroidery sewing machine of this invention is constituted as above-mentioned, also when performing embroidery processing to the processing cloth of a cartridge, and also when performing print processing, the movable range of an embroidery frame and a processing cloth is not restricted too much by interference of a cartridge bed, and the outstanding effectiveness that embroidery processing and print processing can be performed broadly is done so.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the front view of the embroidery sewing machine of the first operation gestalt which materialized this invention.

[Drawing 2] It is the top view showing the frame drive and cartridge bed drive of this embroidery sewing machine.

[Drawing 3] It is the front view showing the actuation at the time of embroidery processing of this embroidery sewing machine.

[Drawing 4] It is the front view showing the actuation at the time of print processing of this embroidery sewing machine.

[Drawing 5] (a) And (b) is the fragmentary sectional view showing a cartridge bed drive.

[Drawing 6] It is the bottom view of the print head of this embroidery sewing machine.

[Drawing 7] It is the flow chart which shows the creation approach of the embroidery data of this embroidery sewing machine, and print data.

[Drawing 8] It is the top view showing an example of actuation of the ink injection device at the time of print processing of this embroidery sewing machine.

[Drawing 9] It is the top view showing example of another of actuation of this ink injection device.

[Drawing 10] It is the top view showing the shank given by this embroidery sewing machine.

[Drawing 11] It is the front view of the embroidery sewing machine of the second operation gestalt which materialized this invention.

[Drawing 12] It is the fragmentary sectional view showing the head drive of this embroidery sewing machine.

[Drawing 13] It is the bottom view of the example of modification of the print head of this embroidery sewing machine.

[Drawing 14] It is the explanatory view in which (a) shows the bottom view of another example of modification of the print head of this embroidery sewing machine, and (b) shows the situation of injection of the color from this print head.

[Drawing 15] It is the top view of the embroidery sewing machine of the conventional example.

[Drawing 16] It is the XVI-XVI line sectional view of drawing 15.

[Description of Notations]

1 Embroidery Sewing Machine

2 Embroidery Head

3 Print Head

5 Cartridge Bed

6 Cartridge Bed Drive

9 Needle

12 Machine Frame

44 Embroidery Sewing Machine

45 Cartridge Bed

47 Embroidery Head
51 Head Drive

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

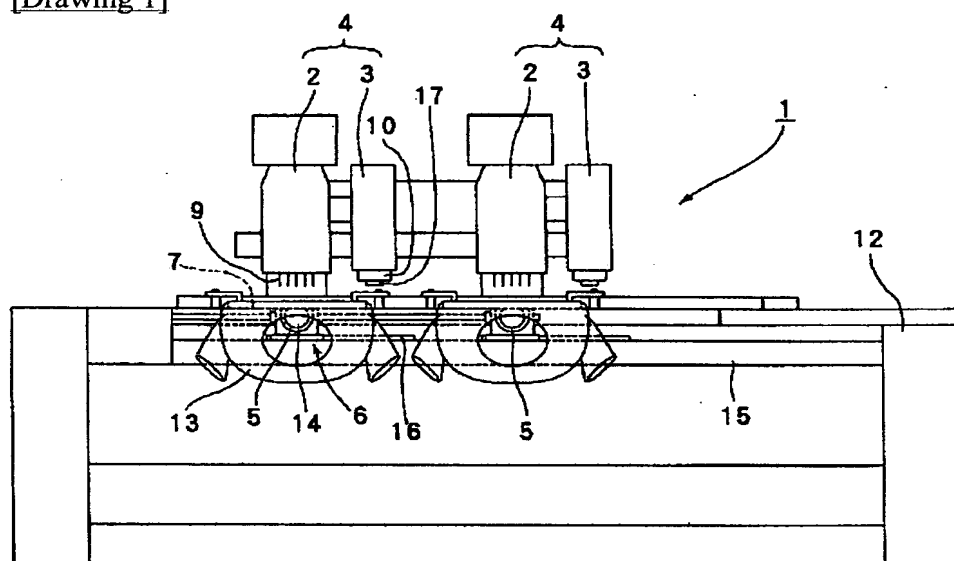
1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

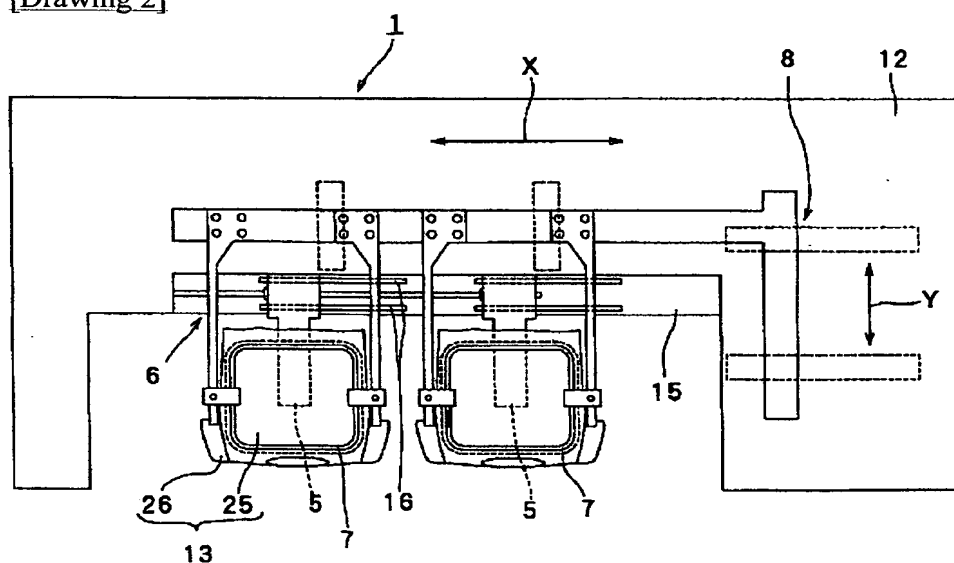
3. In the drawings, any words are not translated.

DRAWINGS

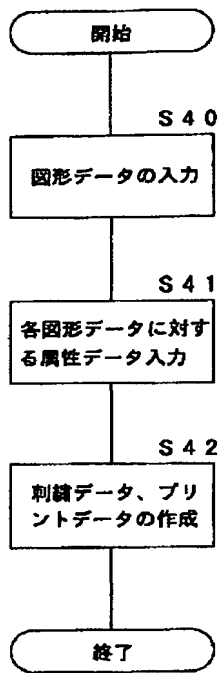
[Drawing 1]



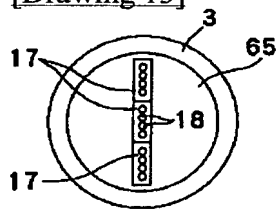
[Drawing 2]



[Drawing 7]

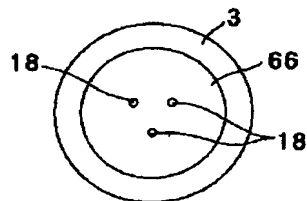


[Drawing 13]

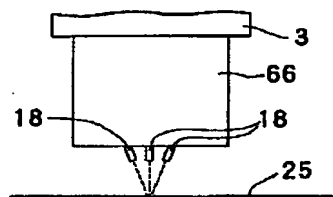


[Drawing 14]

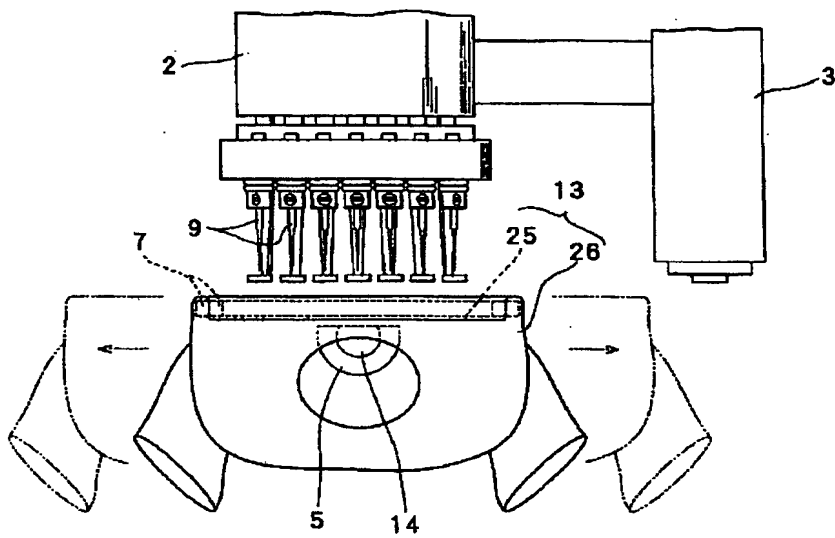
(a)



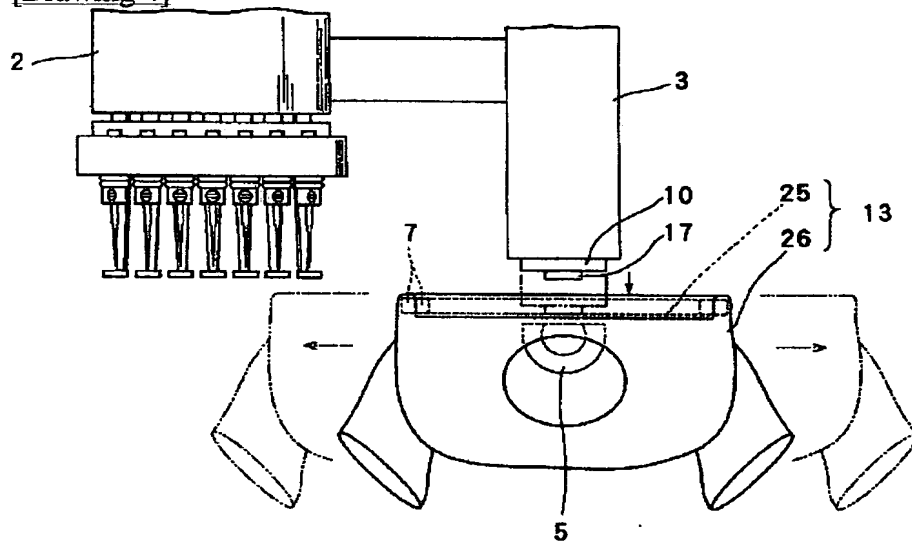
(b)



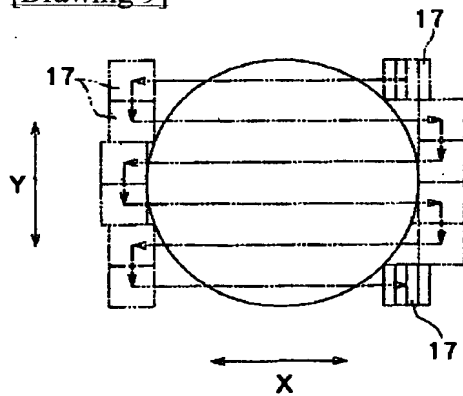
[Drawing 3]



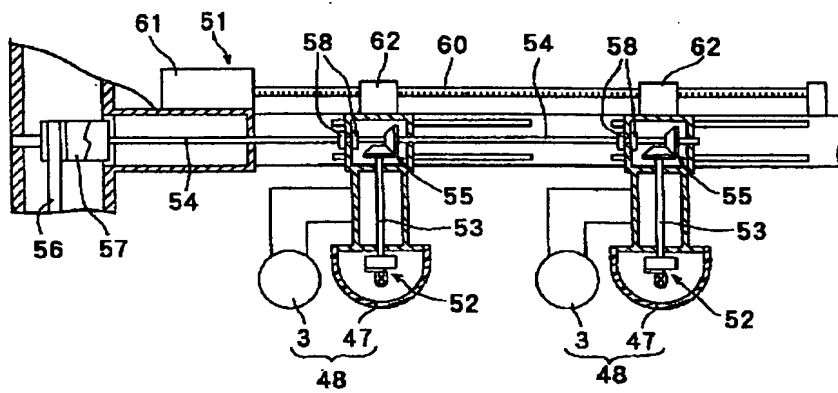
[Drawing 4]



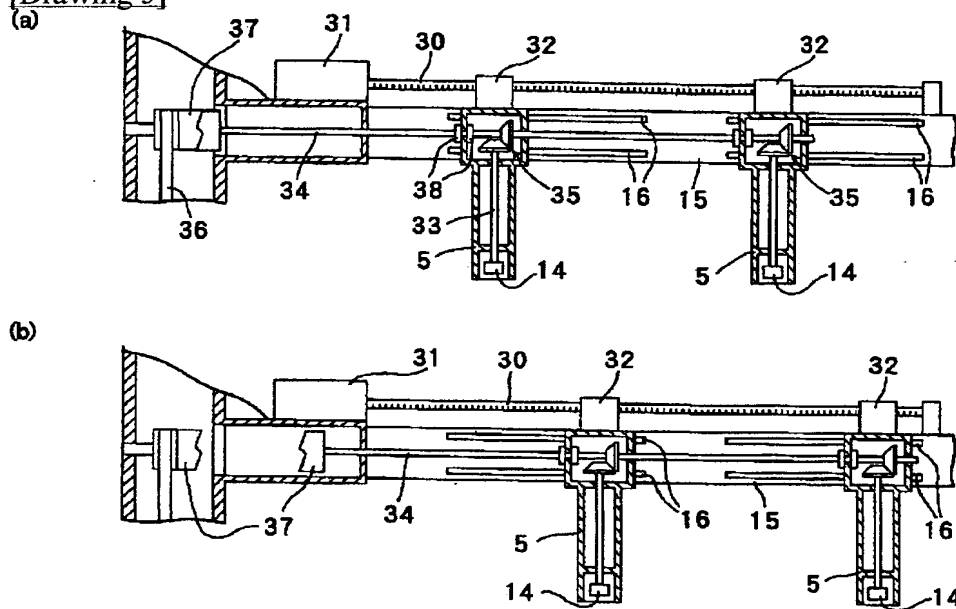
[Drawing 9]



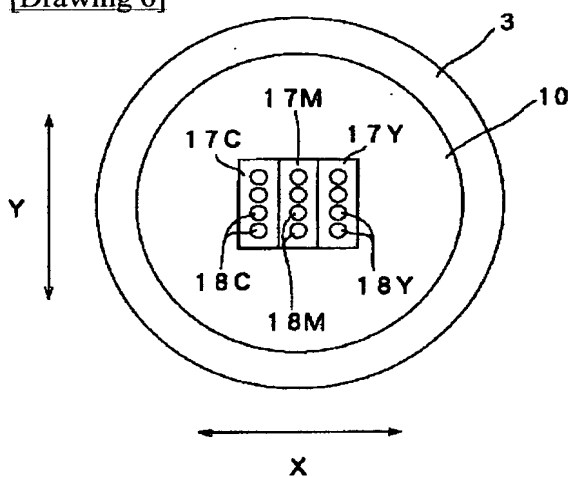
[Drawing 12]



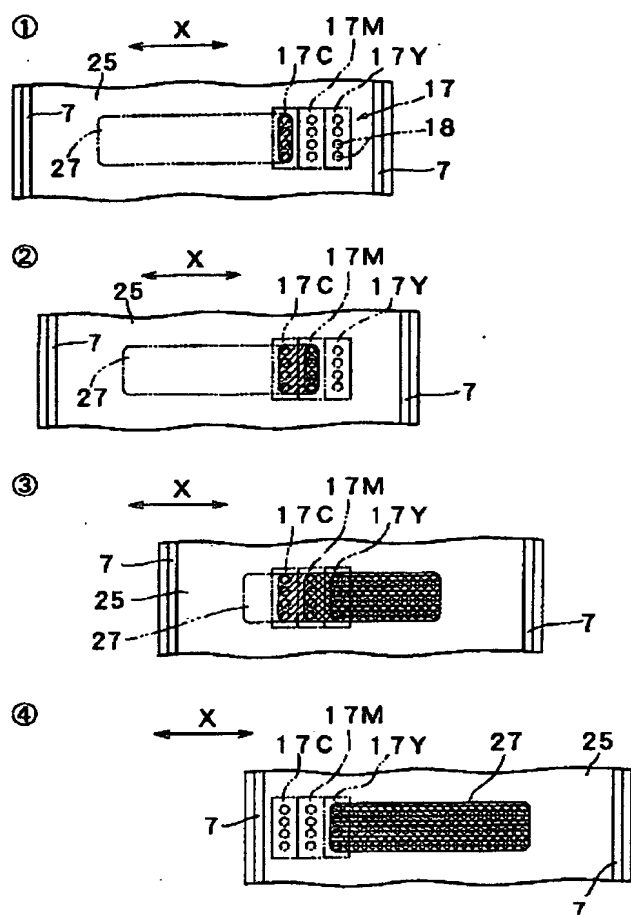
[Drawing 5]



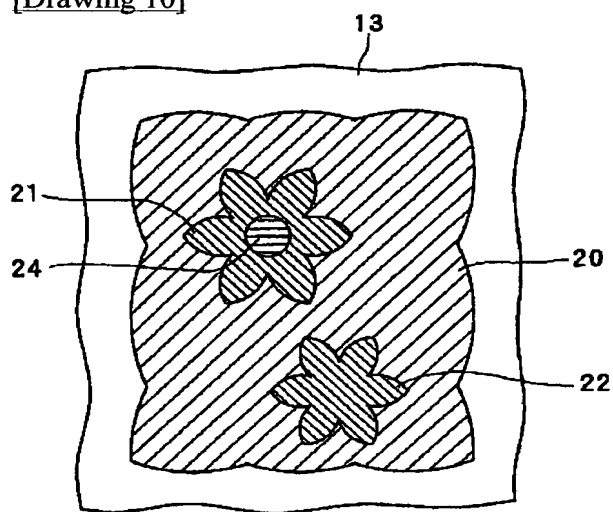
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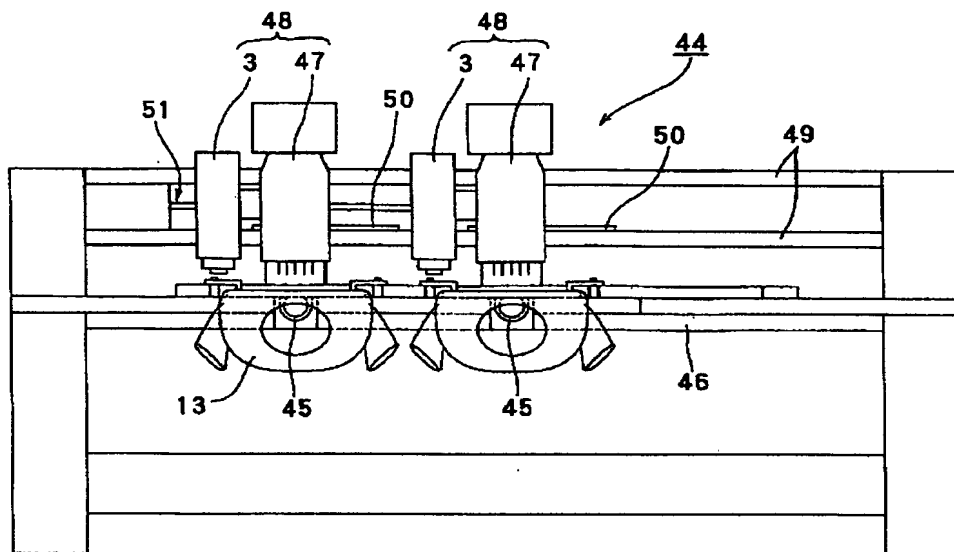
[Drawing 8]



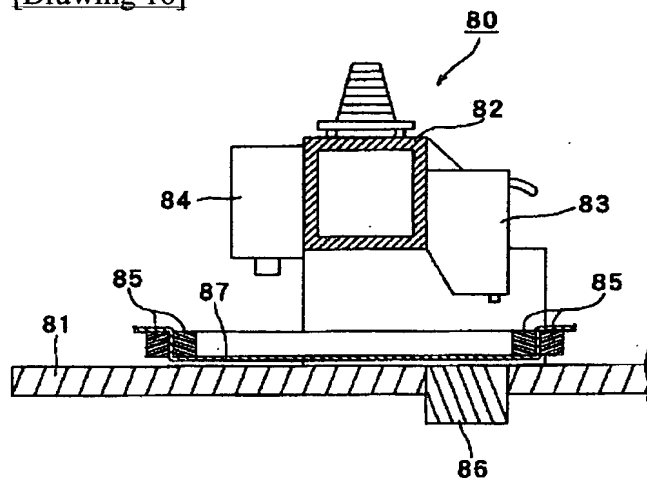
[Drawing 10]



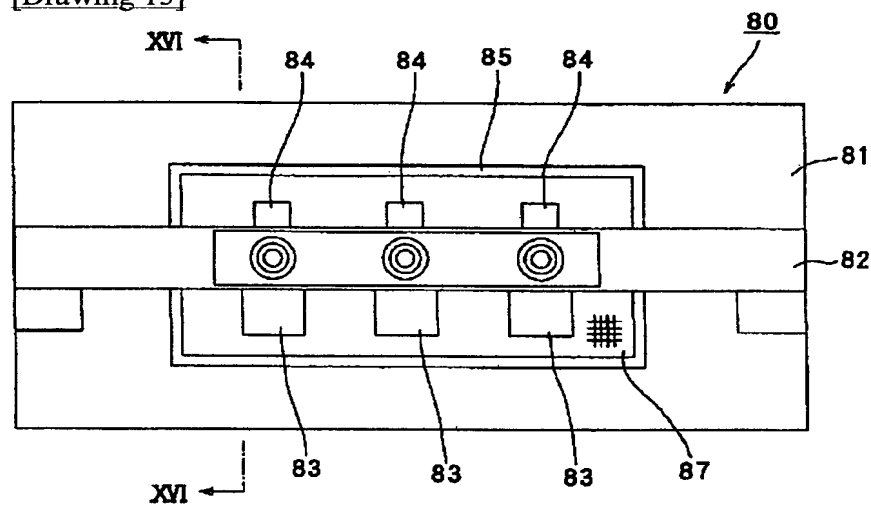
[Drawing 11]



[Drawing 16]



[Drawing 15]



[Translation done.]